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Forest Insect and Disease Management

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BIOLOGICAL
EVALUATION R2-78-5

MOUNTAIN PINE BEETLE

Evaluation of the Proposed
Beulah Cooperative Management
Demonstration Area

Pike and San Isabel
National Forests

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Rocky Mountain Region

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INTRODUCTION

A biological evaluation was conducted on the Pike and San Isabel National Forests to assess current mountain pine beetle (MPB) activity in the vicinity of Beulah, Colorado. The Supervisor's Office requested the evaluation of the area since it is under consideration as a Cooperative Management Demonstration Area (CMDA) [1/].

The proposed Beulah CMDA is part of the current MPB infestation which affects 1.3 million acres of host type over the Colorado Front Range. In 1978 alone, tree loss was estimated at 1.5 to 2 million trees from the various landownership groups.

Entomologists Ken Lister, R-2 FI&DM, and Dave Leatherman, Colorado State Forest Service, assisted by the R-2 FI&DM Survey Specialist, Wilmer Bailey, and Gene Eide, Forester at the Forest Supervisor's Office, conducted the biological evaluation.

DESCRIPTION OF THE AREA

The proposed Beulah CMDA encompasses over 90,000 acres and includes the three small communities of Rye, Beulah, and Wetmore (Fig. 1). The two major drainages in the proposed area are South Hardscrabble Creek and St. Charles River. These drainages and the only RARE II Area (# 269) can be characterized as follows:

> Lower South Hardscrabble Creek Drainage - (most of upper So. Hardscrabble Creek is out of the Beulah CMDA) contains mostly ponderosa pine with sawtimber size patches being scattered throughout in uneven aged stands. Tree mortality has been devastating (100%) in some stands and dominates the scene. The terrain is generally moderate and operable with conventional equipment. Dwarf mistletoe infection is generally heavy within this area on ponderosa pine.

1/ For more detailed information on Cooperative Management Demonstration Areas the reader is referred to Environmental Analysis of the Colorado Front Range Vegetative Management Pilot Project. U. S. Dep. Agric. For. Serv. Region II, 1977.

St. Charles River Drainage - contains mixed conifer stands of ponderosa pine, white fir, Douglas-fir, and Engelmann spruce in the upper and mid-portions while the lower portion is dominated by ponderosa pine. In the mid-portions, pine mortality, including infested trees is very high (over 80%). Red-topped trees dominate the scene. The terrain is generally moderate and operable with conventional equipment except adjacent to the river. Dwarf mistletoe infection is locally heavy on ponderosa pine.

RARE II Area # 269 - generally contains mixed conifer stands of Engelmann spruce, Douglas-fir, and white fir with a few scattered patches of ponderosa pine. Terrain is generally steep characterized by large rock outcroppings. MPB killed trees are present but are not as conspicuous as in the other areas.

PROCEDURES

New and old MPB infested host tree groupings were evaluated in October on the ground to establish the attack ratio. This is accomplished by counting the occurrence of infested trees and those abandoned in 1978. This ratio allows the area to be subjectively evaluated as to accuracy of trend as predicted from brood samples obtained in July (Service Trip Appraisal Report 78-15). Concurrently, the area was sketch mapped aerially to obtain an estimate of red-topped trees - those trees killed from the most recent MPB attacks.

RESULTS AND DISCUSSION

Ground checking of several infestation groups in both South Hardscrabble and St. Charles drainages showed the ratio of infested trees to recently abandoned trees was 1 to 1. This attack ratio of 1:1 concurs with a previous prediction made from brood density samples taken during July 1978.

After evaluating the aerial sketch maps it was estimated that there were about 100,000 red-topped trees within the Beulah CMDA. This is little more than one tree per acre.

If attacked trees were uniformly distributed over the entire area the infestation would probably escape notice. However, tree mortality is grouped and occurs in stands with high basal area containing large-diameter trees. These stands typically occur over moderate terrain boasting well-developed soil.

This type of mortality pattern conflicts with man's utilization of those more desirable forested areas thus the request for assistance to alleviate MPB impacts.

Mortality of ponderosa pine has been very extensive in the mid-portion of the St. Charles drainage and light to moderate in the lower portion. Ponderosa pine mortality to date has ranged from heavy to absent in the South Hardscrabble area. Tree loss and future MPB activity in the RARE II Area # 269 is expected to be light and should not seriously interfere with management action in surrounding areas.

Direct control measures (by chemicals, burning, or removal) for MPB control will only provide temporary relief. It is difficult to justify the need for treatment of all MPB infested trees within the Beulah CMDA. Ponderosa pine mortality is so severe in the St. Charles River drainage that direct control measures may not prevent the loss of the remaining ponderosa pine. The additional cost of direct control in South Hardscrabble Creek to protect property values may be difficult to justify. A combination treatment of thinning and salvage of the dead and infested trees would seem more feasible.

Future tree loss becomes minimal if ponderosa pine stands are thinned to improve individual tree growth. Where growing stock levels (GSL) of stands are reduced to 80 or less, 20 years or more protection against epidemic tree losses to MPB could be expected.

Excellent success in preventing successful MPB attack of individual high value trees has been obtained around homes or in campgrounds by application of protective sprays. Two chemical products are registered for use on green pine trees in Colorado. Two formulations of carbaryl are available for use in Colorado: "Pine Tree and Ornamental Spray" 2/ and "Savit-Sevin 4 Flowable with Molasses" 3/.

2/ Balcom Chemicals, Inc., P. O. Box 1286, Greeley, CO 80631

3/ Griffin Corporation, Valdosto, GA

Reliance on only one alternative is not biologically sound. However, an integrated program that includes several control strategies would be best for a successful program. It is apparent that better resource information is needed for the area to formulate a specific action plan. From such information, which need not be as detailed as the traditional Stage II, a better idea of potential outputs could be established. It follows that an action plan which is timely and responsive to producing the desired outputs should be developed. However, the lack of inventory data should not preclude immediate action in areas of obvious need and opportunity.

SUMMARY OF MANAGEMENT ALTERNATIVES

1. In as short a time as feasible develop a plan to implement appropriate silvicultural treatment wherever practical. Specifically reduce GSL of ponderosa pine stands to 80 or less to improve tree vigor. The St. Charles drainage appears to provide the best opportunity for demonstrating the benefits of needed management to a large number of forest users. 4/

2. Direct control (chemical, burning, and salvage) of MPB infested trees may be needed in limited areas in and adjacent to the towns of Rye and Beulah and intensively developed areas such as Lake Isabel. Generally, a 1/4 mile control buffer around selected areas should be adequate. 4/

3. Encourage the use of protective chemical sprays by private citizens to save high value trees around high value developments.

4. Dwarf mistletoe control should be included in management plans. A formal biological evaluation of this disease may be useful.

5. Direct control or other action against the beetles within the RARE II Area # 269 is NOT RECOMMENDED.

6. Let the infestation run its natural course.

7. Appropriate integration of the six alternatives listed above.

4/ Should the Pike and San Isabel National Forests and the Colorado State Forest Service need funding through Forest Insect & Disease Management refer to FSM 3400 (3430 and 3450).

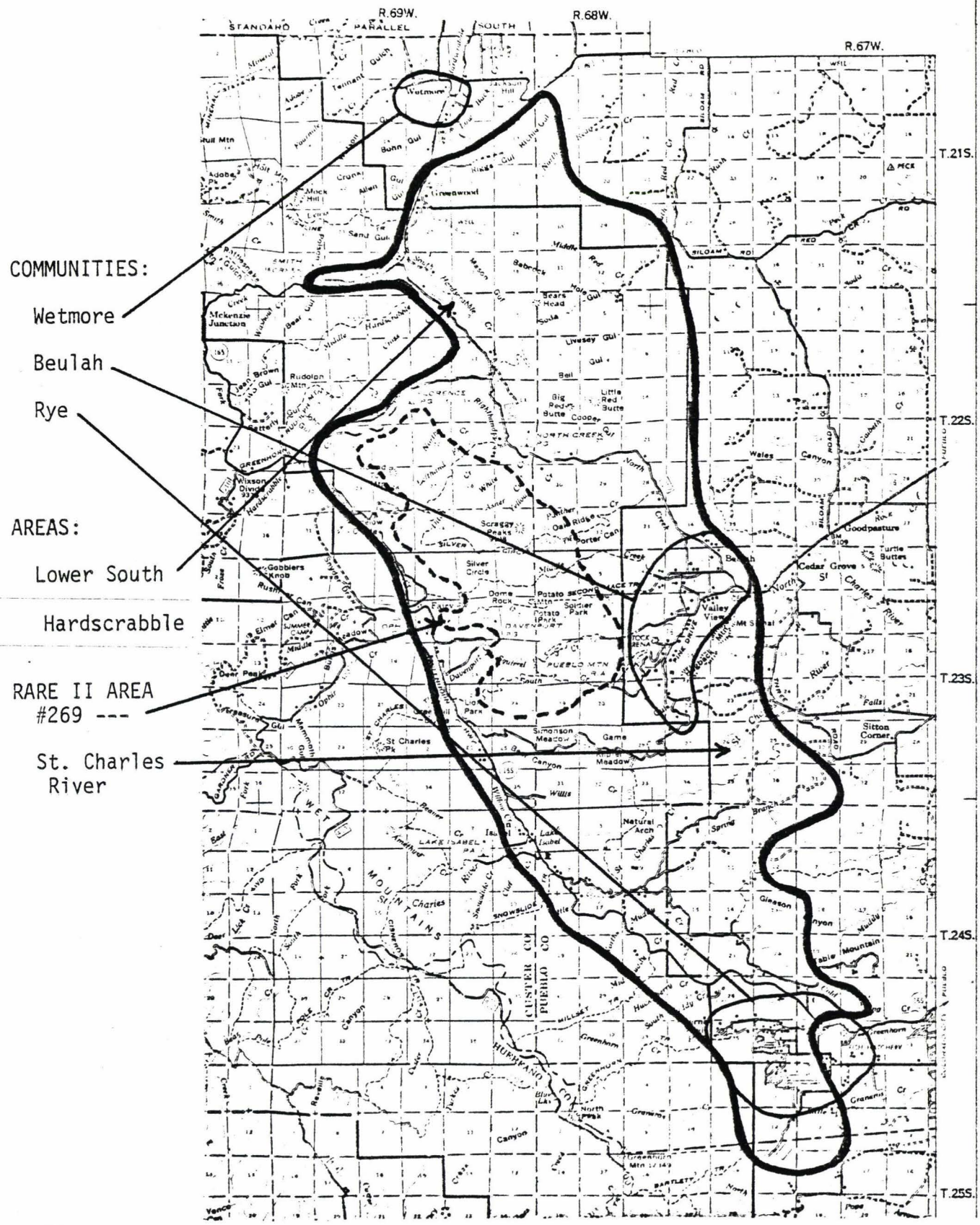

FIGURE 1. Proposed Beulah Cooperative Management Demonstration Area